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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,967	10/20/2003	Marie Hiraizumi	OKI.591	8642

20987 7590 03/29/2005

VOLENTINE FRANCOS, & WHITT PLLC  
ONE FREEDOM SQUARE  
11951 FREEDOM DRIVE SUITE 1260  
RESTON, VA 20190

EXAMINER

MANDALA, VICTOR A

ART UNIT PAPER NUMBER

2826

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/687,967

Applicant(s)

HIRAIZUMI, MARIE

Examiner

Victor A. Mandala Jr.

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/4/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

Claims 1-3 are objected to because of the following informalities:

The claims are objected to because the equation does not detail what the measurement units of  $9.29 * 10^{15}$  is and for 62.46. These are necessary in order to properly calculate the results.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent

Application Publication No. 2003/0227056 Wang et al.

1. Referring to claim 1, a semiconductor device comprising: a substrate, (Figure 13 & 19 #50), having an insulating layer, (Figure 13 & 19 #56), formed thereon; a silicon layer, (Figure 13 & 19 #55 & 62), having a thickness  $t_s$  formed on the insulating layer, (Figure 13 & 19 #56), the silicon layer, (Figure 13 & 19 #55 & 62), including a first area having a first impurity concentration of  $D_f \text{ cm}^{-3}$ , (Paragraph 0041), and a second area having a second condition of  $D_p \text{ cm}^{-3}$ , (Paragraph 0041); a fully-depleted MOSFET formed in the first area of the silicon

Art Unit: 2826

substrate, (Figure 13 & 19 #55 & 62); and a partially-depleted MOSFET formed in the second area of the silicon layer, (Figure 13 & 19 #55 & 62); wherein the semiconductor device satisfies the following condition:  $28 \text{ nm} \leq t_s \leq 42 \text{ nm}$

$$D_f \leq 9.29 * 10^{15} * (62.46 * t_s)$$

$$D_f \leq 2.64 * 10^{15} * (128.35 * t_s)$$

$$D_p \geq 9.29 * 10^{15} * (62.46 * t_s)$$

$$D_p \geq 2.64 * 10^{15} * (129.78 * t_s), \text{ (Paragraph 0045 Lines 3-5 \& Paragraph 0056 Lines 15-16).}$$

2. Referring to claim 2, a semiconductor device, wherein the device satisfies condition of  $D_f \leq 3.00 * 10^{15} * (102.67 * t_s)$ , (Paragraph 0045 Lines 3-5 & Paragraph 0056 Lines 15-16).

3. Referring to claim 3, a semiconductor device, wherein the device satisfies condition of  $D_p \geq 3.29 * 10^{15} * (125.70 * t_s)$ , (Paragraph 0045 Lines 3-5 & Paragraph 0056 Lines 15-16).

4. Referring to claim 4, a semiconductor device, wherein the thickness of the silicon layer has a range 38 nm to 42 nm, the impurity concentration  $D_f$  is equal or more than  $1.9 * 10^{17} \text{ cm}^{-3}$ , and the impurity concentration  $D_p$  is equal or less than  $2.2 * 10^{17} \text{ cm}^{-3}$ , (Paragraph 0045 Lines 3-5 & Paragraph 0056 Lines 15-16).

5. Referring to claim 5, a semiconductor device, wherein the thickness of the silicon layer has a range 33 nm to 37 nm, the impurity concentration of  $D_f$  is equal or less than  $2.5 * 10^{17} \text{ cm}^{-3}$ , and the impurity concentration  $D_p$  is equal or more than  $2.7 * 10^{17} \text{ cm}^{-3}$ , (Paragraph 0045 Lines 3-5 & Paragraph 0056 Lines 15-16).

6. Referring to claim 6, a semiconductor device, wherein the thickness of the silicon layer has a range 28 nm to 32 nm, the impurity concentration of  $D_f$  is equal or less than  $2.7 * 10^{17}$

Art Unit: 2826

cm<sup>-3</sup>, and the impurity concentration Dp is equal or more than  $3.2 * 10^{17}$  cm<sup>-3</sup>, (Paragraph 0045 Lines 3-5 & Paragraph 0056 Lines 15-16).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor A. Mandala Jr. whose telephone number is (571) 272-1918. The examiner can normally be reached on Monday through Thursday from 8am till 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAMJ  
3/10/05

  
NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800